July 29, 1969 A. PERUCCHETTI 3,458,641

REFRACTORY LINING FOR ARC FURNACES, ADAPTED TO FACILITATE DISMEMBERING UPON COMPLETION OF A CAMPAIGN

Filed Dec. 26, 1967 3 Sheets-Sheet 1

Fig.1

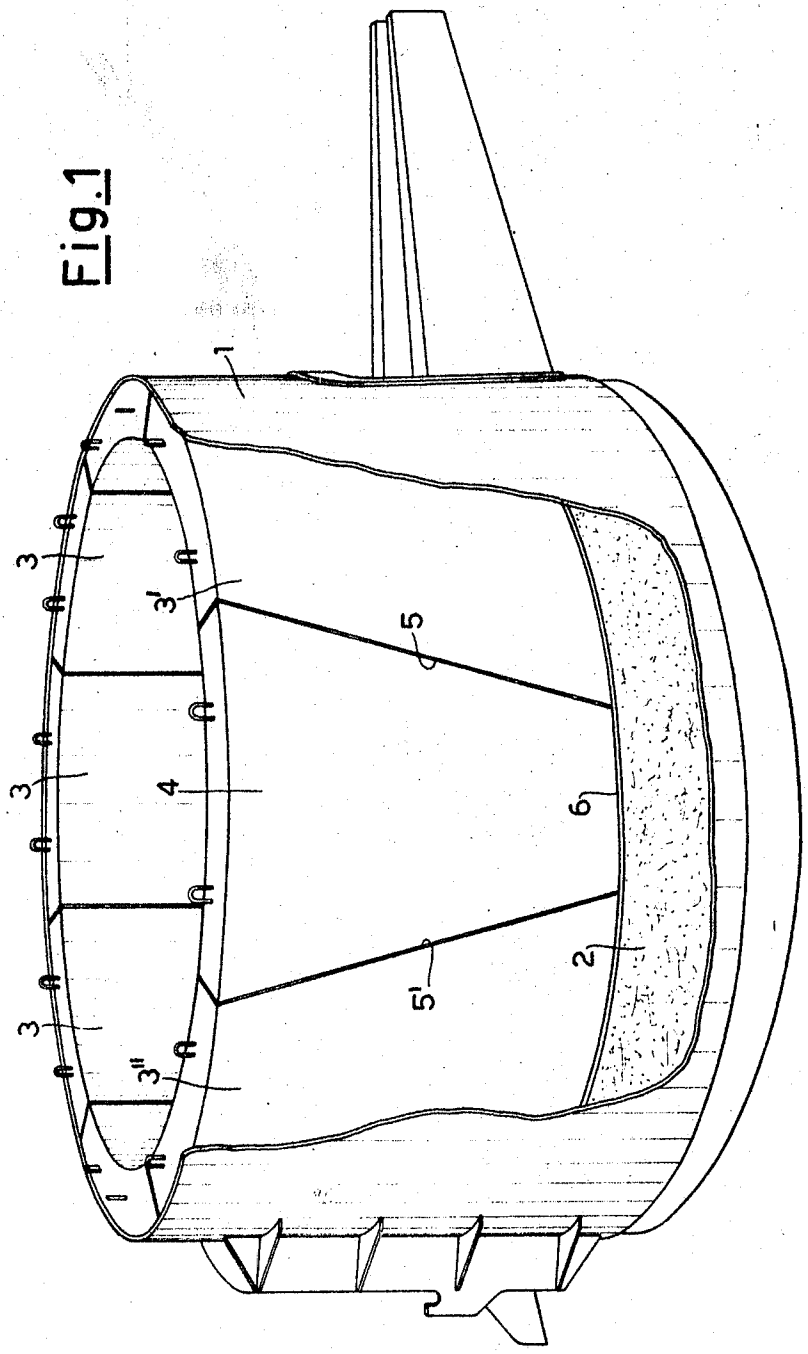

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Fig. 2

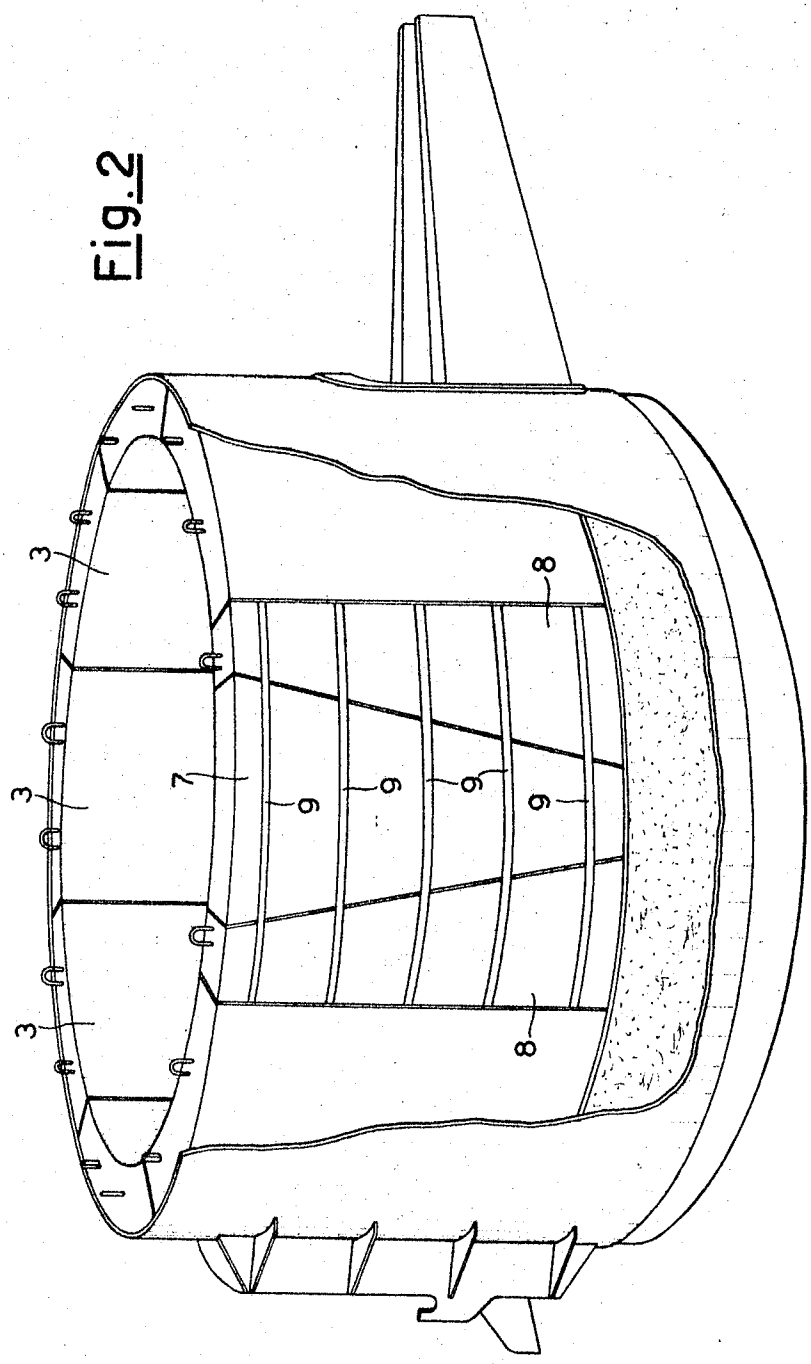

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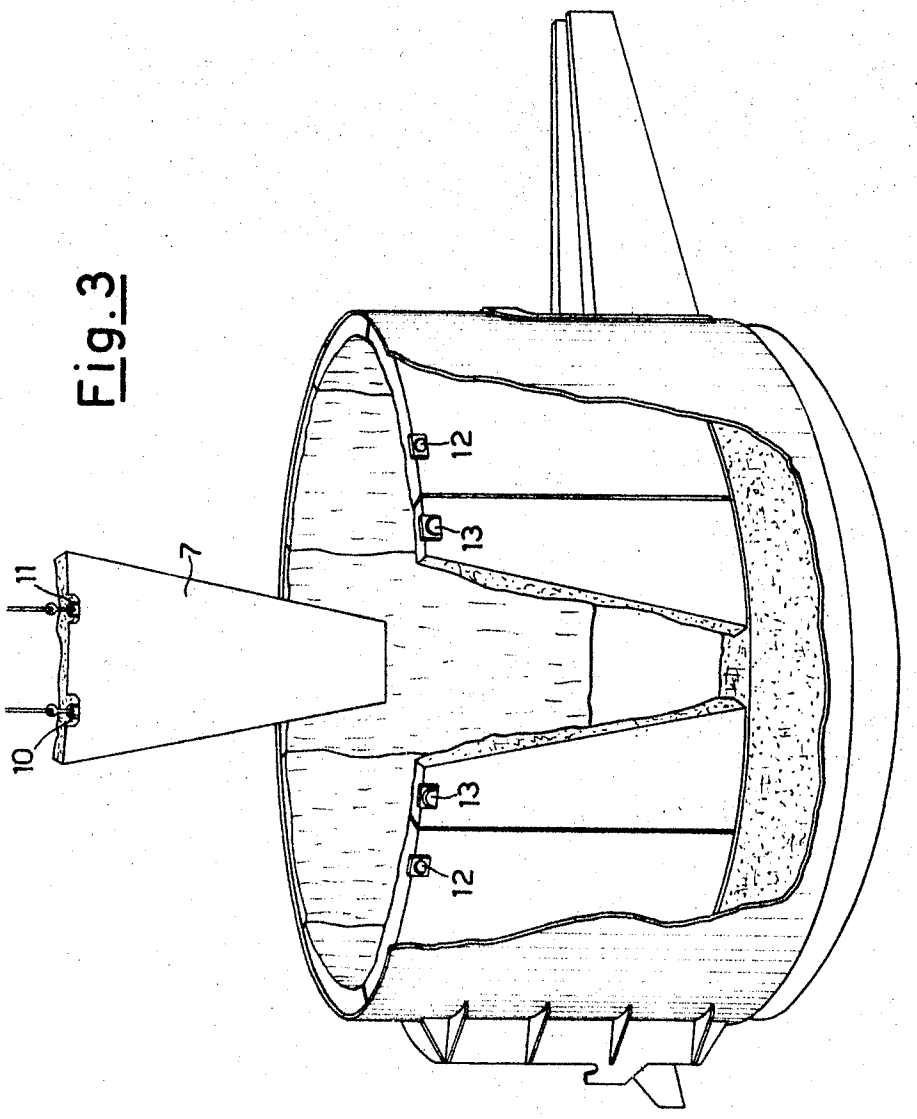
Fig. 3



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REFRACTORY LINING FOR ARC FURNACES, ADAPTED TO FACILITATE DISMEMBERING UPON COMPLETION OF A CAMPAIGN

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Int. Cl. H05b 1/00, 5/00
U.S. Cl. 13—35 3 Claims

ABSTRACT OF THE DISCLOSURE

A refractory, dolomite-block, lining for electric arc furnaces is disclosed, wherein one of the blocks, or a limited portion thereof, is wedge shaped and is positioned with its smallest side down, as having the advantage of permitting an extremely easy withdrawal from the lining assembly, and consequently facilitating the dismantling of the lining at the end of a campaign inasmuch as, once the wedge shaped block has been removed first, the other blocks can be very readily withdrawn.

Background of the invention

It is known that the problem of reducing the down times for replacing a refractory lining in electric arc furnaces for steel works, has come to an end, has always been a taxing one for steel men, and especially those people who have to run electric furnaces of a large size.

It is likewise known that, in European countries, the conventional lining adopted for steel electric arc furnaces consists of large size dolomite blocks, made according to the Crespi Italian Patent No. 433,162, which is specifically referred to herein, said blocks having made possible, upon their advent in the immediate post-war years, a considerable spare of time in the lining replacement operations, both as compared with the rammed linings directly made in the furnaces and with the refractory brick linings. Every individual dolomite block, indeed, constitutes a considerable fraction of the wall of the furnace to be lined, from ¼, ⅙, ⅛ and is positioned in the furnace within a short time, by virtue of the use of hoisting mechanisms, and resorting to the specially provided hooks which jut from the top of the block. Also the worn-out blocks, as a campaign has come to an end, are withdrawn from the furnace, still with the aid of hoisting mechanisms, by virtue of other specially provided hooks embedded in the portion of the residual blocks (FIG. 3, item 12).

It may sometimes occur, however, that the last mentioned operation is slowed down by the difficulty of removing the first worn out block since it firmly sticks to the adjoining blocks and to its base, and this operation may even take several hours. Once the first worn out block has been withdrawn, the others readily follow up.

It is also known that, prior to proceeding with the demolition of the worn out blocks, it is necessary to wait several hours to allow the furnace to cool, in order to enable the servicemen to enter the furnace so as to start the above mentioned burdensome operation.

Summary of the invention

An object of the present invention is to provide a refractory lining for electric arc furnaces, which is adapted to facilitate the operation of withdrawing the worn out blocks and thus the operation of replacing the worn out blocks as a whole, while doing away with the above enumerated shortcomings.

The lining subject of this invention is, in fact, characterized in that one of the blocks which forms the lining is wedge shaped and has its smaller side down, so that it is easier to remove this block than the other ones, by lifting it.

It is apparent, in fact, that the friction on the sidewalls of the wedge with the adjacent blocks is virtually done away with as the wedge is unstuck and the force which is necessary to part the wedge off its resting base is also considerably reduced, inasmuch as the wedge rests on its smaller base.

According to an exemplary embodiment, the wedge-shaped block is positioned between its two adjoining blocks, the latter having been specially arranged with sidewalls having very much the same slope as those of the wedge-shaped block.

According to another, preferred embodiment, the wedge is the central portion of a block having a size and a shape equal to those of the other blocks, the wedge being connected to the two lateral gores by means of steel hoops. By so doing, the assembly of the lining is greatly facilitated on account of the fact that the composite block is inserted under very much the same conditions as the other blocks, and, on the other hand, the ease of demolition is not jeopardized, in the slightest, since the wedge can be removed first, independently of the lateral gores which are fitted, in turn, with demolition hooks (FIG. 3, item 13).

For the sake of clarity and by way of example, a few embodiments have been illustrated in the accompanying drawings.

Brief description of the drawings

In the drawings:

FIGURE 1 is a perspective, diagrammatical view of a furnace having a lining according to the invention.

FIGURE 2 is a perspective, diagrammatical view of a furnace having a lining made according to an alternative embodiment of this invention.

FIGURE 3 shows the lining when demolition is under way.

Description of the preferred embodiments

In the furnace depicted in FIG. 1, the refractory lining on the interior of the outer shell **1**, and above the tamped bottom **2** consists of a plurality of dolomite blocks **3** having a virtually sectoral configuration, between which is inserted a wedge-shaped block **4**, sandwiched between the two adjoining blocks **3'–3''** having sidewalls **5–5'** with the same slope as that of the wedge **4**. The wedge block **4** rests on the bottom with its smaller side **6**.

In the furnace shown in FIG. 2, the lining is still made up of blocks **3** having a substantially sectoral-cylindrical outline, but the wedge **7** forms the central portion of a block **8** which has the same shape and size as the remaining blocks **3**: in this case, the wedge **7** is connected to the two lateral gores by horizontal steel hoops, **9**. In this case, the block **8**, so composed, can be prefabricated and installed more easily than the embodiment shown in FIG. 1. As the lining is to be dismantled (FIG. 3), the wedge **7** is withdrawn first by taking it by the hooks **10** and **11**, specially provided for dismantling.

I claim:

1. A refractory lining for electric arc furnaces, comprising large size dolomite blocks, one of said blocks having the shape of a wedge positioned with its smaller side down and thus it can be withdrawn in an easier way than the other blocks by vertical hoisting.

2. A lining according to claim **1**, characterized in that said wedge-shaped block is positioned between the two adjoining blocks which have been prepared with sidewalls having the same slope as that of the sides of the wedge.

3. A lining according to claim 1, characterized in that said wedge forms the central portion of a block having the same size and shape as the other blocks, said wedge being connected to the two lateral gores of the block by means of horizontal hoops or other means.

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U.S. Cl. X.R.

52—224, 245, 249; 266—43